

NASA TECH BRIEF



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Chemical Treatment Makes Aromatic Polyamide Fabric Fireproof in Oxygen Atmosphere

A chemical process has been developed to make a textile-quality organic fabric nonflammable in an oxygen-rich atmosphere. The process is applied to a proprietary, strong, flexible aromatic polyamide fabric that is flameproof in air, but not in a pure oxygen (6.2 psia) atmosphere.

The process consists of a two-step treatment in which the fabric is reacted under controlled conditions first with the vapors from a solution consisting of equal parts by weight of phosphorus oxychloride and phosphorus oxybromide and then with bromine vapor. After neutralization of the treated fabric surface, the resultant strong, flexible material passed the standard tissue paper ignition test on a folded edge in pure oxygen at a pressure of 6.2 psia.

A higher degree of flame resistance in oxygen can be imparted to the fireproof fabric produced in the two-step oxyhalide-bromine process by subsequent soaking of the fabric with a proprietary mixture (aqueous solution/suspension) of ammonium polyphosphates. The dried fabric will not be ignited on an exposed

bottom cut edge by a burning tissue in pure oxygen at 6.2 psia. However, the polyphosphates are leached out and their beneficial effects lost by washing the fabric in water-detergent solutions.

Note:

Requests for further information may be directed to:

Technology Utilization Officer
Manned Spacecraft Center, Code BM7
Houston, Texas 77058
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Patent status:

No patent action is contemplated by NASA.

Source: Roland O. Cardwell, John R. Holsten, and James W. Rives of Monsanto Research Corp. under contract to Manned Spacecraft Center (MSC-13571, -13572)

Category 04